

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:
 - a semiconductor substrate;
 - a conductive plug electrically connected to the semiconductor substrate;
 - 5 a silicon carbide film provided on the conductive plug;
 - a metal compound film provided on the silicon carbide film and containing a metal carbide; and
- 10 an electrode provided on the metal compound film.
2. A semiconductor device comprising:
 - a semiconductor substrate;
 - a conductive plug electrically connected to the semiconductor substrate;
 - 15 a silicon carbide film provided on the conductive plug;
 - a metal compound film provided on the silicon carbide film and containing a metal carbide;
 - a capacitor lower electrode provided on the metal compound film;
 - 20 a capacitor upper electrode provided above the capacitor lower electrode; and
 - a capacitor dielectric film provided between the capacitor lower electrode and the capacitor upper electrode and containing a ferroelectric material or a highly dielectric material as a major component.
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3. The semiconductor device according to claim 1,
wherein the conductive plug is electrically connected
to an active region of a transistor provided on the
surface of the semiconductor substrate.

5 4. The semiconductor device according to claim 2,
wherein the conductive plug is electrically connected
to an active region of a transistor provided on the
surface of the semiconductor substrate.

10 5. The semiconductor device according to claim 1,
wherein the metal carbide contains a carbide of
titanium, zirconium, hafnium, vanadium, niobium, or
tantalum.

15 6. The semiconductor device according to claim 2,
wherein the metal carbide contains a carbide of
titanium, zirconium, hafnium, vanadium, niobium, or
tantalum.

20 7. The semiconductor device according to claim 3,
wherein the metal carbide contains a carbide of
titanium, zirconium, hafnium, vanadium, niobium, or
tantalum.

8. The semiconductor device according to claim 4,
wherein the metal carbide contains a carbide of
titanium, zirconium, hafnium, vanadium, niobium, or
tantalum.

25 9. The semiconductor device according to claim 1,
wherein the metal compound film further contains a
compound of a metal contained in the metal carbide and

silicon.

10. The semiconductor device according to claim 2,
wherein the metal compound film further contains a
compound of a metal contained in the metal carbide and
5 silicon.

11. The semiconductor device according to claim 3,
wherein the metal compound film further contains a
compound of a metal contained in the metal carbide and
silicon.

10 12. The semiconductor device according to claim 4,
wherein the metal compound film further contains a
compound of a metal contained in the metal carbide and
silicon.

15 13. The semiconductor device according to claim 5,
wherein the metal compound film further contains a
compound of a metal contained in the metal carbide and
silicon.

20 14. The semiconductor device according to claim 6,
wherein the metal compound film further contains a
compound of a metal contained in the metal carbide and
silicon.

25 15. The semiconductor device according to claim 7,
wherein the metal compound film further contains a
compound of a metal contained in the metal carbide and
silicon.

16. The semiconductor device according to claim 8,
wherein the metal compound film further contains a

compound of a metal contained in the metal carbide and silicon.

17. A method of manufacturing a semiconductor device comprising:

- 5 preparing a semiconductor substrate;
- forming a conductive plug electrically connected to the semiconductor substrate;
- forming a silicon carbide film covering an upper surface of the conductive plug;
- 10 forming a first metal film on the silicon carbide film;
- forming a second metal film on the first metal film;
- forming a dielectric film containing a ferroelectric material or a highly dielectric material which is a major component on the second metal film; and
- 15 forming a metal compound film on the silicon carbide film by heat treatment in an oxidizing atmosphere, the metal compound film comprising a metal carbide of a metal contained in the first metal film and carbon.

20 18. The method according to claim 17, wherein the first metal film is a titanium film, zirconium film, hafnium film, vanadium film, niobium film, or tantalum film.

25 19. The method according to claim 17, further

comprising: forming a third metal film on the metal compound film; processing the third metal film, the metal compound film, the dielectric film, the second metal film, and the silicon carbide film by etching;
5 and carrying out a heat treatment in an oxidizing atmosphere.

20. The method according to claim 18, further comprising: forming a third metal film on the metal compound film; processing the third metal film, the metal compound film, the dielectric film, the second metal film, and the silicon carbide film by etching;
10 and carrying out a heat treatment in an oxidizing atmosphere.

15 21. The method according to claim 17, wherein the dielectric film is a capacitor dielectric film, and the second and third metal films are capacitor lower and upper electrodes.

20 22. The method according to claim 18, wherein the dielectric film is a capacitor dielectric film, and the second and third metal films are capacitor lower and upper electrodes.

25 23. The method according to claim 19, wherein the dielectric film is a capacitor dielectric film, and the second and third metal films are capacitor lower and upper electrodes.

24. The method according to claim 20, wherein the dielectric film is a capacitor dielectric film, and the

second and third metal films are capacitor lower and upper electrodes.